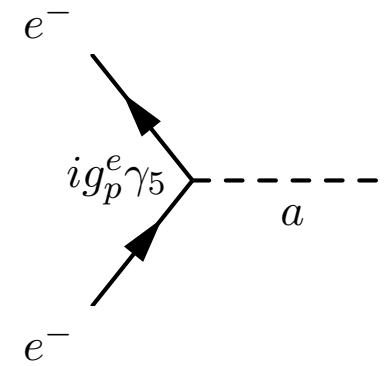


# STATUS OF QUAX R&D

SEARCHING FOR GALACTIC AXIONS THROUGH MAGNETIZED MEDIA

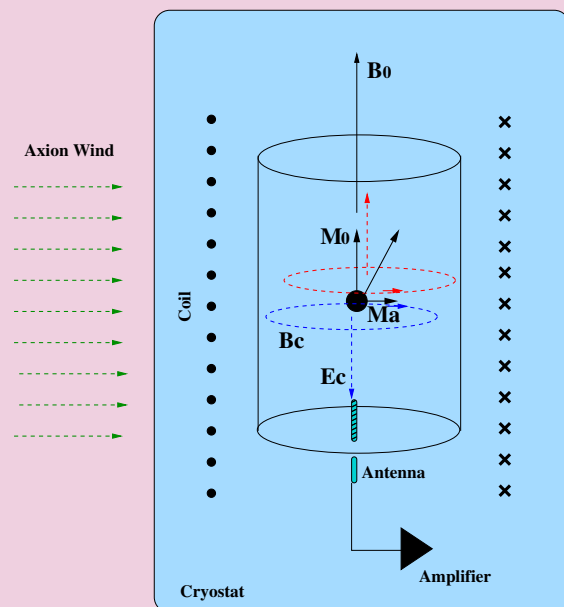


# QUAX: QUEST FOR AXIONS

arXiv:1806.00310

## Quax Experimental Scheme

Use Electron Spin Resonance to absorb energy from Axion Wind and re-emit it as *e.m.* radiation.  
Use resonant cavity to avoid radiation dumping.

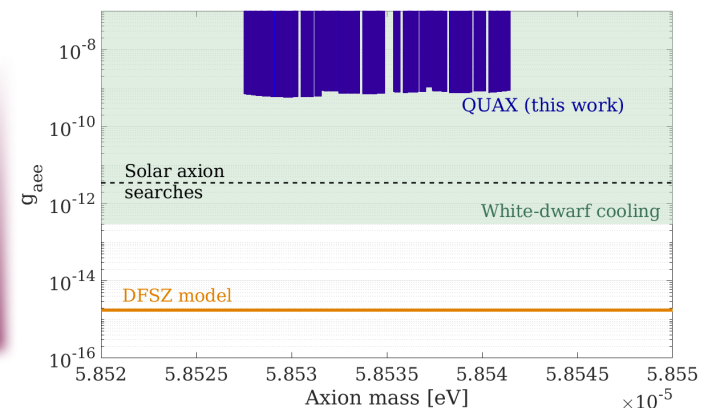


Sensitive to axion-electron coupling!

$$\lambda_a = \frac{h}{mv_a} \gg L_{detector}$$

Barbieri et al. Phys. Dark Univ. 15 (2017) 135

First result with a “ferromagnetic” haloscope!



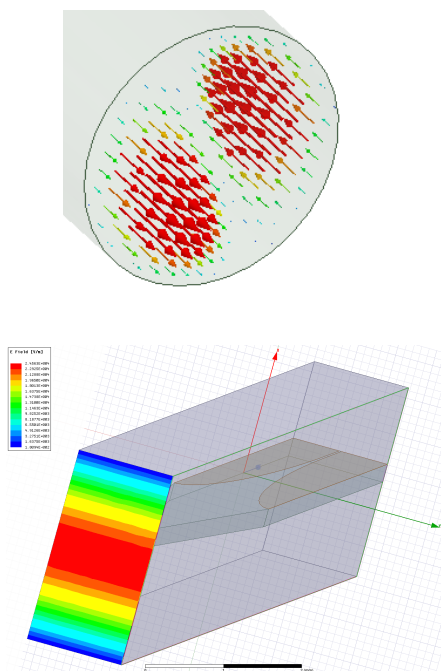
### Pilot Experiment in arXiv:1806.00310

B [T]	0.5
N. of GaYIG Sphere (diameter = 1 mm)	5
$n_s$ [spin/m <sup>3</sup> ]	$2.1 \times 10^{28}$
$\tau_{\min}$ [ $\mu$ s]	0.11
Frequency [GHz]	13.98
Cu-cavity Q (mode TM110)	50,000
$T_{\text{cavity}}$ [K]	5.0

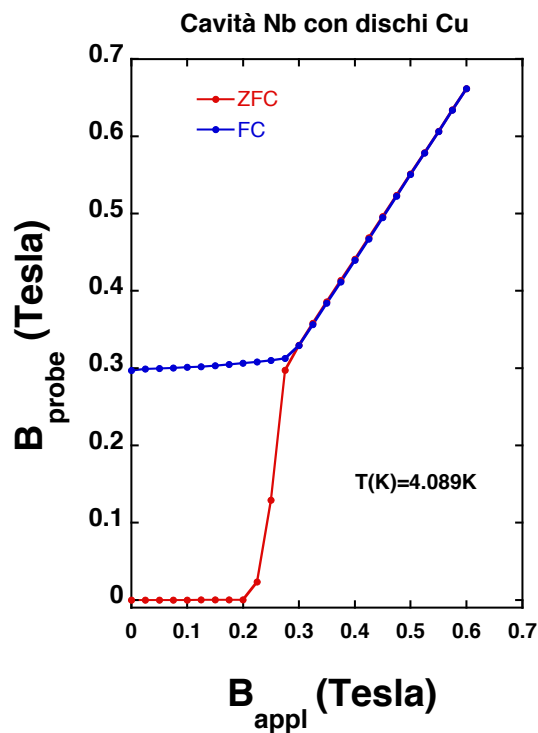
# SUPERCONDUCTIVE RESONANT CAVITIES

- Nb, NbTi and MgB<sub>2</sub> Superconductive cavities under test at LNF.

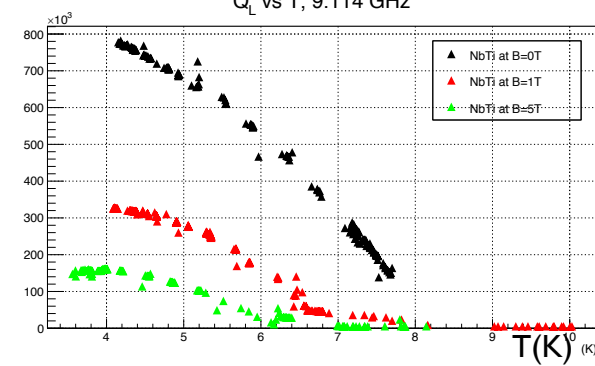
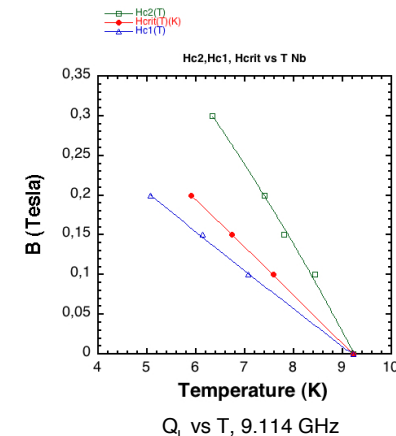
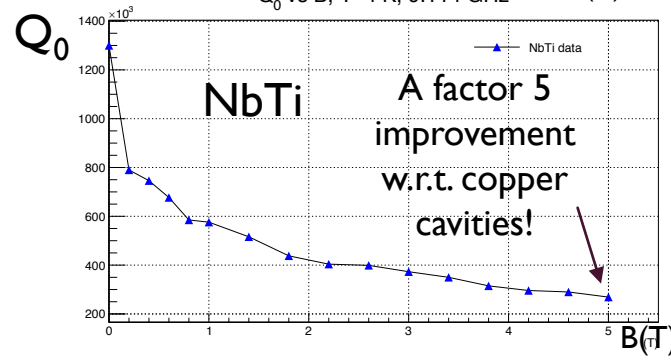
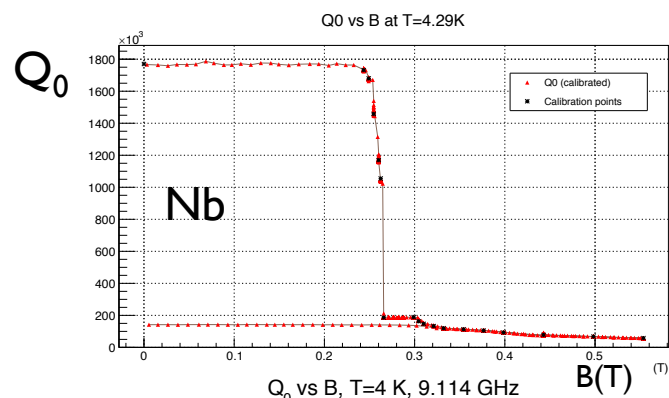
## RF Simulations



## B field measurements

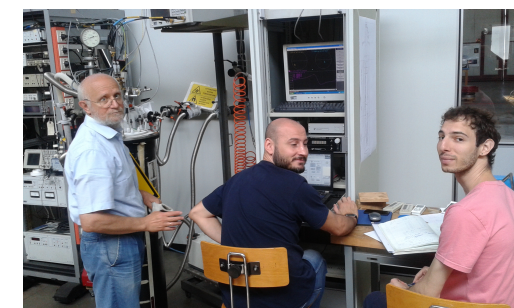
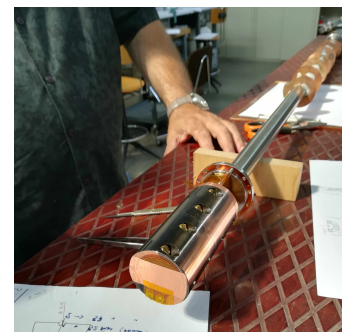
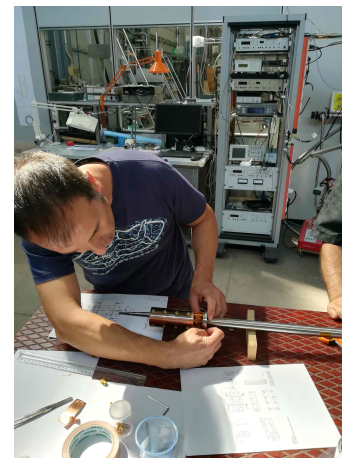


## Measurement of Quality factor vs B and T



# ANAGRAFICA

QUAX - LNF		FTE 2018	FTE 2019*
Claudio Gatti	R	1	0.5
Daniele Di Gioacchino	R	1	0.5
Carlo Ligi	T	0.5	0.2
Giuanluca Lamanna (Pi)	R	0.2	0.2
David Alesini	PT	0.2	0.1
Simone Tocci	Borsista	-	-
Alessio Rettaroli	Laureando	-	-



Supporto Tecnico: M.Iannarelli, G.Pileggi, G.Papalino, F.Tabacchioni (INAF).

Richieste per l'anno prossimo invariate o rimodulate in base alla approvazione degli altri progetti (SIMP, KLASH-TDR).

\*Provvisori, dipende da approvazione SIMP e da come procede KLASH